



# **Maine Farm Safety Program**

Bulletin #2305

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## **Upright Silo Safety**

Silos are very important to many farm operations, but they are also the source of many accidents. These accidents include falls, electrocution, entanglement in augers and silo gas inhalation.

### ◆ **Safety Guidelines for Silos**

Make silos off limits to children and unauthorized personnel. Barricade or lock silos up. Keep portable ladders away from these areas. All feed storage ladders should end at least seven feet off the ground. Make sure these ladders are in sound condition. When filling or emptying silos, never allow people in or around them. Warning decals recognizable to children should be on silo filling equipment.

Lockout the power supply on all unloading mechanisms. Serious injuries have occurred when someone was inside a silo and the unloader started. It is very important to be able

to lock the switch off to electric or PTO powered silo unloaders. This will prevent anyone from starting the unloaders when someone is inside the structure.

### ◆ **Entering Silos**

If the silo needs work, try to find a way of getting the job done without entering it. If this cannot be done, take these safety measures:

#### **Upright Silo Safety**

- ◆ **Wear a respirator when handling moldy silage.**
- ◆ **Keep silos off limits to unauthorized personnel.**
- ◆ **Avoid exposure to silo gasses.**
- ◆ **Have plenty of help and use a rope and safety harness when entering a dangerous silo situation.**
- ◆ **Lockout the power supply on unloading mechanisms.**



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**Make sure you have installed ladders inside and out of all silos.** Do not rely on a rope, chain or pipe ladder hanging from the roof. They are not reliable and may obstruct flow during filling or increase drag during unloading. If you should become trapped in a silo, stay near the outer wall and keep moving. If necessary, you can carefully walk around the outer edge until the bin is empty and the flow stops.

**Always use a rope and safety harness when entering a dangerous silo situation.** Never rely on a second person outside the bin to whom you shout instructions. Outside noise may block out or garble your calls for action or help. The second person may fall or stumble in the panic and haste of climbing and running to shut down equipment.

**Always have three people involved when entering a questionable storage situation.** Lifting one person on a rope and safety harness from inside requires two people on the outside. One can then go for help while the other gives preliminary aid.

***Always use a rope and safety harness when entering a dangerous silo situation.***

## ◆ **Respiratory Problems**

Farmer's Lung and Toxic Organic Dust Syndrome (TODS) are two respiratory diseases that affect farmers. Breathing dusts from decayed plant material over a period of time can lead to these very serious diseases.

Farmer's Lung is an allergy caused by dust from moldy hay, straw and grain. Anyone who is allergic to hay mold spores and who breathes air filled with these mold spores can get Farmer's Lung. Symptoms usually occur four to six hours after being exposed to hay mold spores. These symptoms include increased coughing and bringing up more mucous than usual, fever and sometimes chills, shortness of breath, discomfort in the lungs, and a tightness and/or pains in the chest. The allergic reactions can either be acute or chronic. Acute attacks resemble the flu or pneumonia and, in extreme cases, the victim may go into shock. Chronic reactions resemble nagging chest colds. But by the time the person receives treatment, permanent damage is already done. People with Farmer's Lung who do not avoid hay mold may get sicker and sicker until they are no longer able to do hard work and, after many years, may be unable to be active at all. People can die from Farmer's Lung. Permanent lung damage is only prevented by eliminating the exposure to mold dusts.



If you think you have Farmer's Lung, see your physician. Explain your symptoms. Some physicians may not be very familiar with the disease, so it may be necessary to refer you to a specialist. A blood test, a chest x-ray and a breathing capacity test are some of the tests used to diagnose Farmer's Lung. Other tests may be needed as well.

Toxic Organic Dust Syndrome (TODS) is caused by exposure to very large amounts of dust. TODS symptoms are identical to those resulting from an acute Farmer's Lung attack. TODS is not an allergic reaction. Anyone can get TODS and can become very sick from this condition, but most people recover completely. Having TODS does not damage the lungs and does not increase the risk of getting TODS again.

#### ◆ **Mold**

Spoiled hay and silage produces mold spores that can be inhaled through the nose and mouth. These spores irritate sensitive tissue in the mouth and nose. Sometimes this can cause severe reactions and hospitalization. Never work alone and unprotected in heavy mold dust. Always wear a respirator that can filter fine dust particles. Avoid unnecessary exposure to mold dust.

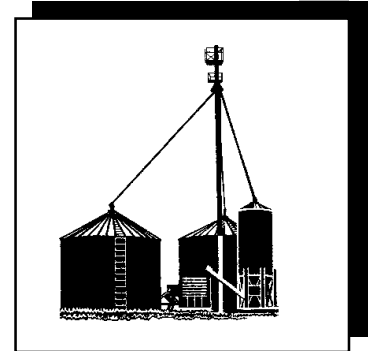
To prevent mold growth, follow proper filling and chopping guidelines for good fermentation. Use

rocks, chains, tires, lime or other weights, but never use silage to hold down plastic covers. If mold growth occurs, wet down the top layer of silage before removing it. This prevents moldy dust from becoming airborne. This should be done even if the silage was covered with a plastic sheet, because the top layers still tend to mold. Handle dusty materials mechanically if this creates less dust or keeps you far enough away. Wear a close fitting mechanical filter respirator.

#### ◆ **Silo Gases**

Nitrogen dioxide ( $\text{NO}_2$ ) is a deadly silo gas. It forms as a result of chemical reactions that begin almost immediately after chopped plant material is placed in a silo. Nitrogen dioxide is heavier than air and can flow out and settle near the ground. It may be visible as a reddish to yellowish-brown haze around the base of a recently filled silo. It has a characteristic bleach-like odor and leaves a burning sensation in the nose, throat and chest. Nitrogen dioxide can result in instant death or permanent lung damage. The first three weeks after filling a silo is when the risk of exposure is greatest.

Carbon dioxide ( $\text{CO}_2$ ) is also a hazard. It replaces the air in the confined headspace of a silo. As with nitrogen dioxide, the risk of exposure is greatest the first three weeks after filling a silo.

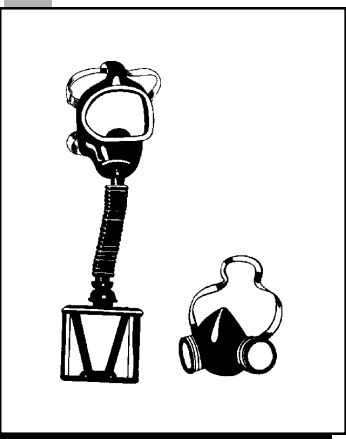




Due to risk of exposure to nitrogen dioxide and carbon dioxide, stay out of silos during filling and for three weeks, unless you wear an air-supplying respirator. If a silo must be entered, do it immediately after blowing the last load into the structure. Leave the blower running for ventilation while anyone is inside. Wear a lifeline and have outside help available. Post a silo gas warning, and declare the silo off-limits to everyone. Lock up all unloading mechanisms.

Post all appropriate warning signs. Oxygen-limiting silos require a sign that warns people of the absence of oxygen. People need to be told to stay away from these areas and never enter them.

A few days before starting to use silage, pull the cover off the filler opening. Do this from the ground using a rope to avoid climbing up the chute. Maximize ventilation of the chute and silo by whatever means possible for 30 minutes before entering. Taking these precautions will help to ensure a safer working environment for all farm workers and help prevent accidents.



Always wear a self-contained breathing apparatus if you must enter the silo within four to six weeks after filling. Have three people outside to help if needed. Keep a hatch door open near the level of the silage within the silo. Running the blower for 15 minutes or more will help freshen the silo. Keep it running constantly to provide as much air movement as possible. Should anyone collapse as a result of exposure to silo gas, get them to a physician immediately.

#### ◆ **Bunker Silo Safety Tips**

When working with bunker silos, there are some safety guidelines that need to be followed. When packing, use caution on the edges. Never exceed silo limits. Use a four-wheel-drive tractor. Cover rapidly and completely. Never make the silo so high that it is dangerous to unload. Do not make it taller than the top of the tractor bucket that is unloading it.

**This Maine Farm Safety Fact Sheet is part of an educational fact sheet series produced by the University of Maine Cooperative Extension. For more information on farm safety, contact your county Extension office.**



Published and distributed in furtherance of Acts of Congress of May 8 and June 30, 1914, by the University of Maine Cooperative Extension, Vaughn H. Holyoke, Director for the University of Maine Cooperative Extension, the Land Grant University of the state of Maine and the U.S. Department of Agriculture cooperating. Cooperative Extension and other agencies of the U.S.D.A. provide equal opportunities in programs and employment. 7/95



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